

Developing a benchmark model for nearly zero energy terraced building in Brussels

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ABSTRACT

This project is focus on the study of near zero energy terraced building in the city of Brussels. The objective is to develop a database of nZETB and develop a benchmark model representative of this database. The methodology followed is simple, firstly there is a collection data step, then the database is created, and finally, it's possible to start the modeling process. Aiming to quantified the real performance of buildings after "Batex" renovation (Belgium Government Project). This study try to define from different projects the most effect renovation strategy, to transfer this expertise to other city or countries.

KEYWORDS

Benchmark – Energy performance – Zero energy building – Survey – Terraced building

PROBLEM

The residential sector in Belgium is mainly composed of old constructions that consume a lot (bad or no insulation). Combined with climate change and the inevitable decrease of fossil energy, there is a real need to reduce the energy consumption in the residential sector which moreover has great renovation potential.

OBJECTIV/HYPOTHESIS

- Characterize & Understand the performances of Brussels's terraced near zero energy building in Brussels
- Developing an energy performance database of terraced near zero energy building in Brussels
- Developing a benchmark model for nearly zero energy terraced building

AUDIENCE

- Belgian Government Authority in charge of Batex : Brussels Environment (<https://environnement.brussels/search/content/batex>)
- Eco-building constructors in Brussels
- Architects living in the nZETB

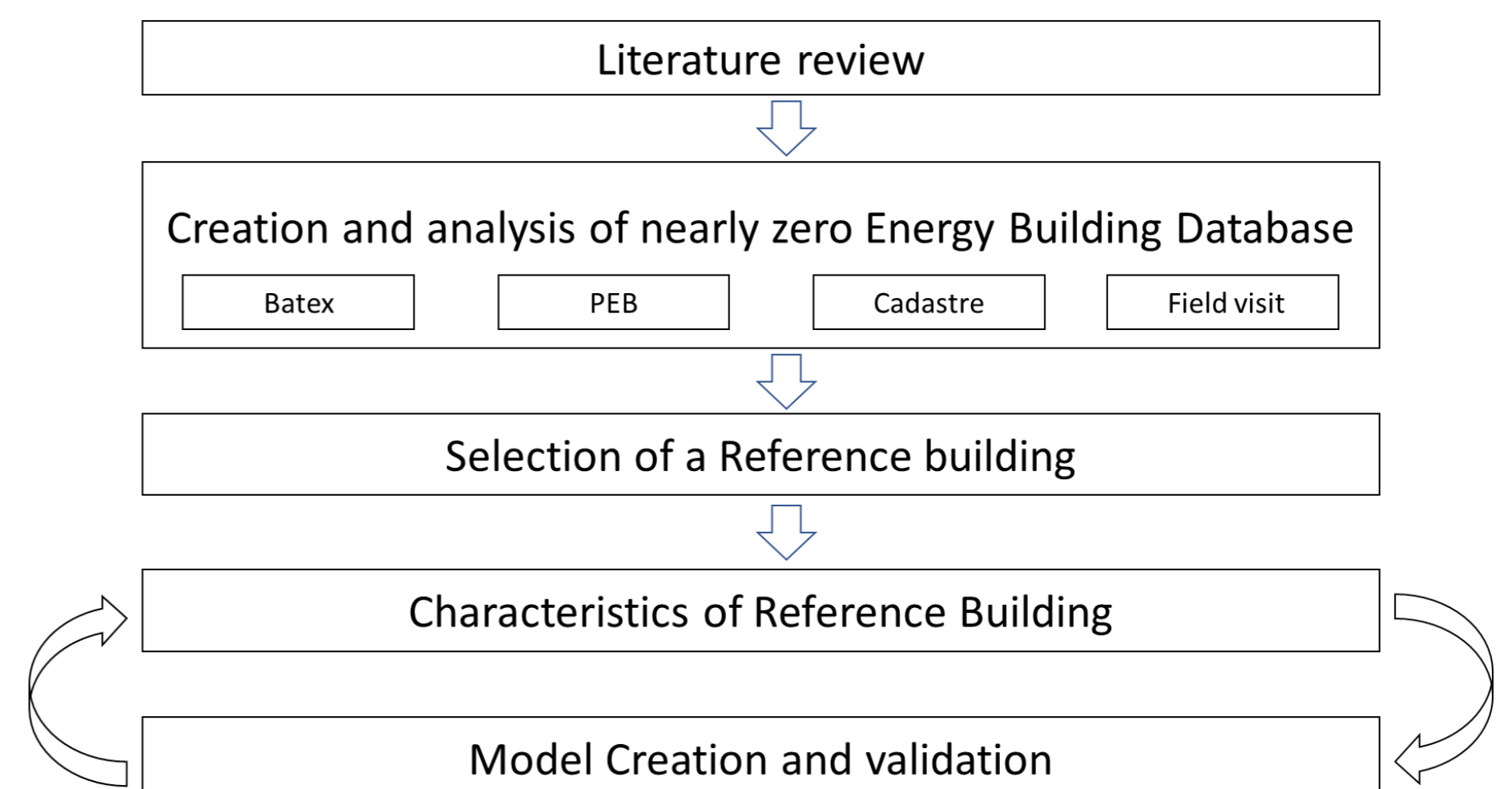
RESEARCH QUESTION

What are the concrete impacts of recent terraced near zero energy building renovations (after 2010) on their energy consumption and thermal comfort?

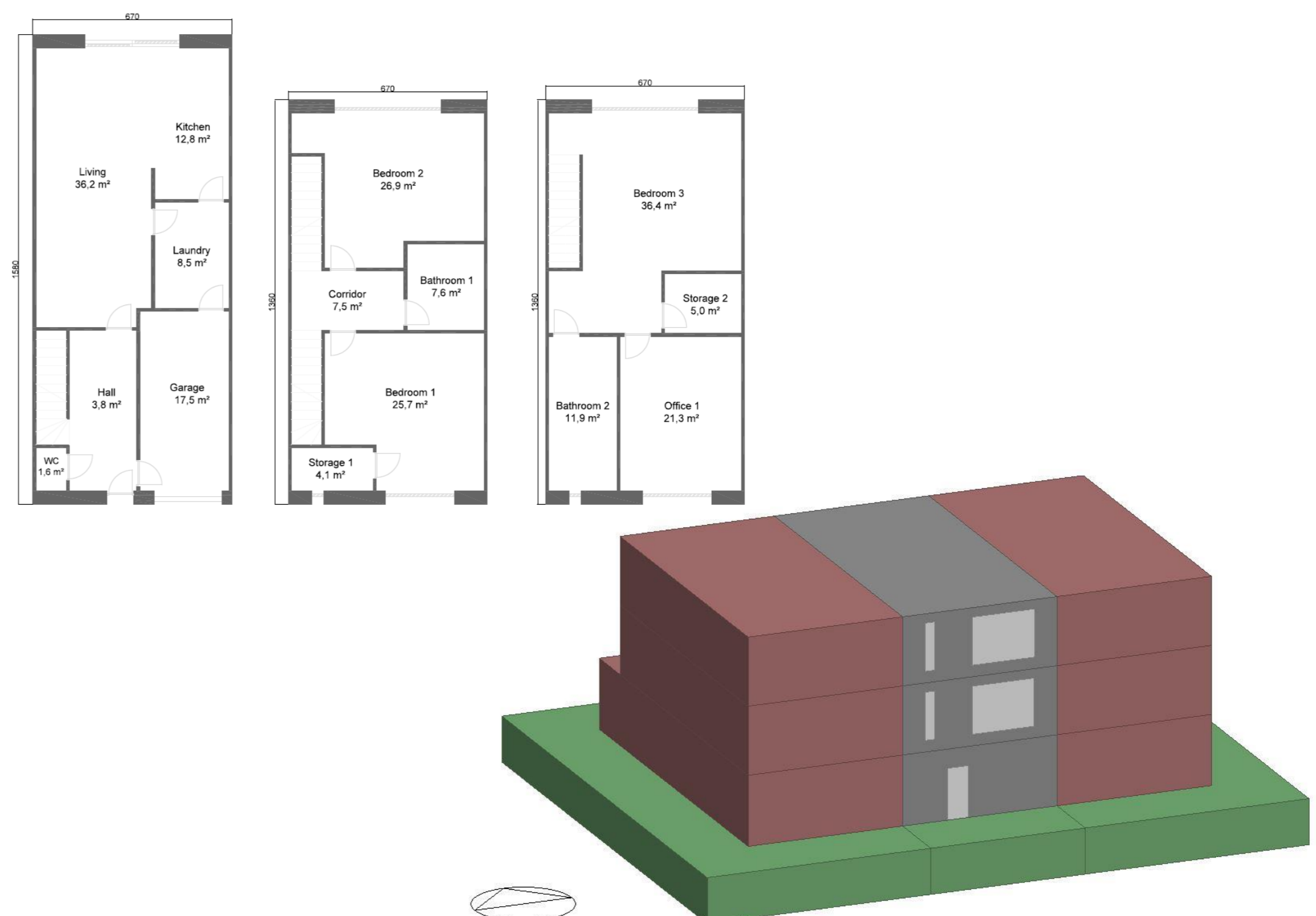
ORIGINALITY

- The research investigated only on low or ultra-low energy terraced buildings
- The research investigated only on recently constructed or renovated buildings (after 2010)

METHODOLOGY



RESULTS



CONCLUSION

For this study, the references building is the number 18 of the database. In addition to its plans and modeling, here are its main features

Address	Construction	Surfaces	Heating Energy Demand	Airtightness	Compactness	K-level	Cost €	Cost area [€/m²]
112 Rue Konkel	1948	179	12,0	0,5	3,53	32,5	259 550	1450

The result confirms the presence of a significant energy performance gap between the early design performance assumptions and the real performance.

RESOURCES

- S.Attia, N.Shadmanfar, F.Riccia Developing two benchmark models for nearly zero energy schools 2019
- Batex Database, Available : <https://environnement.brussels/thematiques/batiment-et-energie> [accessed: 15/11/2020]
- Brussels PEB Database, Available : <https://www.peb-epb.brussels/certificats-certificaten> [accessed: 01/11/2020]